ABSTRACT

A fiber optic fault detector and generic fiber optic sensor system for detecting breaks in an optical fiber using a low coherence interferometric technique. The system comprises a light source configured to produce light traveling along the optical path, a modulator optically coupled to the light source configured to modulate at least a portion of the light as a function of a modulation signal, a detector optically coupled to the modulator configured to produce a detector output based upon a sensed intensity of the light, and an electronic array configured to receive the detector output and determine the optical fault. The low coherence interferometric technique allows for detection of a fault in the fiber with a minimal amount of test equipment and with higher measurement sensitivity and resolution. The system may alternatively include a transducer, positioned in place of the fiber under test, having a response which changes in reflective or optical path length. The system can be used in a LIDAR system, wherein telescope optics are used in place of the fiber under test, to transmit light and collect light scattered from objects or from the air.

ABSTRACT

A fiber optic fault detector and generic fiber optic sensor system (100) for detecting breaks in an optical fiber under test (150) using a low coherence interferometric technique. The system (100) comprises a light source (102) configured to produce light traveling along an optical path, a modulator (107) optically coupled to the light source. The modulator (107) is configured to modulate at least a portion of the light as a function of a modulation signal. A detector (108) is optically coupled to the modulator (107) and is configured to produce a detector output based upon a sensed intensity of the light. An electronic array (126) is configured to receive the detector output and determine the optical fault. The low coherence interferometric technique allows for detection of a fault in the fiber under test (150) with a minimal amount of test equipment and with higher measurement sensitivity and resolution. The system (100) may alternatively include a transducer, positioned in place of the fiber under test (150), having a response which changes in reflective or optical path length. The system (100) can be used in a LIDAR system, wherein telescope optics are used in place of the fiber under test (150), to transmit light and collect light scattered from objects or from the air.

Figure 1